Out Of Basin Transfer (OOBT)

A Presentation to the Water Allocation Program Advisory Committee

Committee Members:

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Mission

- Develop criteria for out-of-basin transfers that protect the reasonable needs of water basins.
- Activities toward the mission
  - Developed definitions for “water basin”, “out-of-basin transfer”, and “geographic water accounting area”
  - Performed a GIS Analysis of water and wastewater conveyances in the Chipuxet Subbasin
  - Recommended actions to address OOBT

Definitions

- **Water Basin -** an area of land from which all waters drain, on the surface or beneath the ground, to a common point or altitude.
- **Out-of-Basin Transfer -** any conveyance of water, including wastewater, by any means regardless of the quantity involved, out of a water basin.
- **Geographic Water Accounting Area -** areas or basins in which comprehensive water use information will be periodically accounted for.

Note...

"altitude" in the definition is intended to cover subsurface drainage to coastal areas

National Research

- AWWA/NEWWA organization
- Council of State Governments
- MA Interbasin Transfer Act
- Regulated Riparian Model Water Code

MA Interbasin Transfer Act

- Positive aspects
  - Comprehensive assessment (state NEPA process)
  - Well coordinated among state agencies
  - Strong policy message
- Negative aspects
  - Overly regulatory (few applications approved)
    - Extensive and burdensome application process
    - Unintended consequences
  - Coordination gaps at local level

Regulated Riparian Model Water Code

- Committee was guided by various principles
  - General provisions
  - OOBT provisions
  - Integrated surface and subsurface systems
  - Special Water Management Area
  - Strong Conservation Emphasis

Positive Effects of OOBT

- Basin of Origin
  - **Potential monetary compensation for water transferred**
- Receiving Basin
  - **Provides water to support development in water short areas and during emergencies**
  - **“Stressed basin” conditions can be alleviated**

Negative Effects of OOBT

- Basin of Origin
  - **Alters the natural hydrologic cycle**
  - **Reduces availability of water for use including fire-fighting**
  - **Lower stream flows impact usability of the resource and viability of wildlife habitat**
  - **Typically, no provision for return flows to recharge the resource**
  - **Politically unpalatable from an equity standpoint**

Negative Effects of OOBT

- Receiving Basin
  - **Alters the hydrologic cycle**
  - **Discharged wastewater impacts water quality**

Current OOBT Practices

- **Contracts between suppliers**
  - Providence system serves 20 communities by exporting large volumes of surface water out of the basin to several other basins including some in the East Bay
  - East Bay water districts serve 7 communities by importing water from MA, combined with local supplies
  - Westerly district imports water from, and exports water to, the state of CT but most transfer is intrabasin

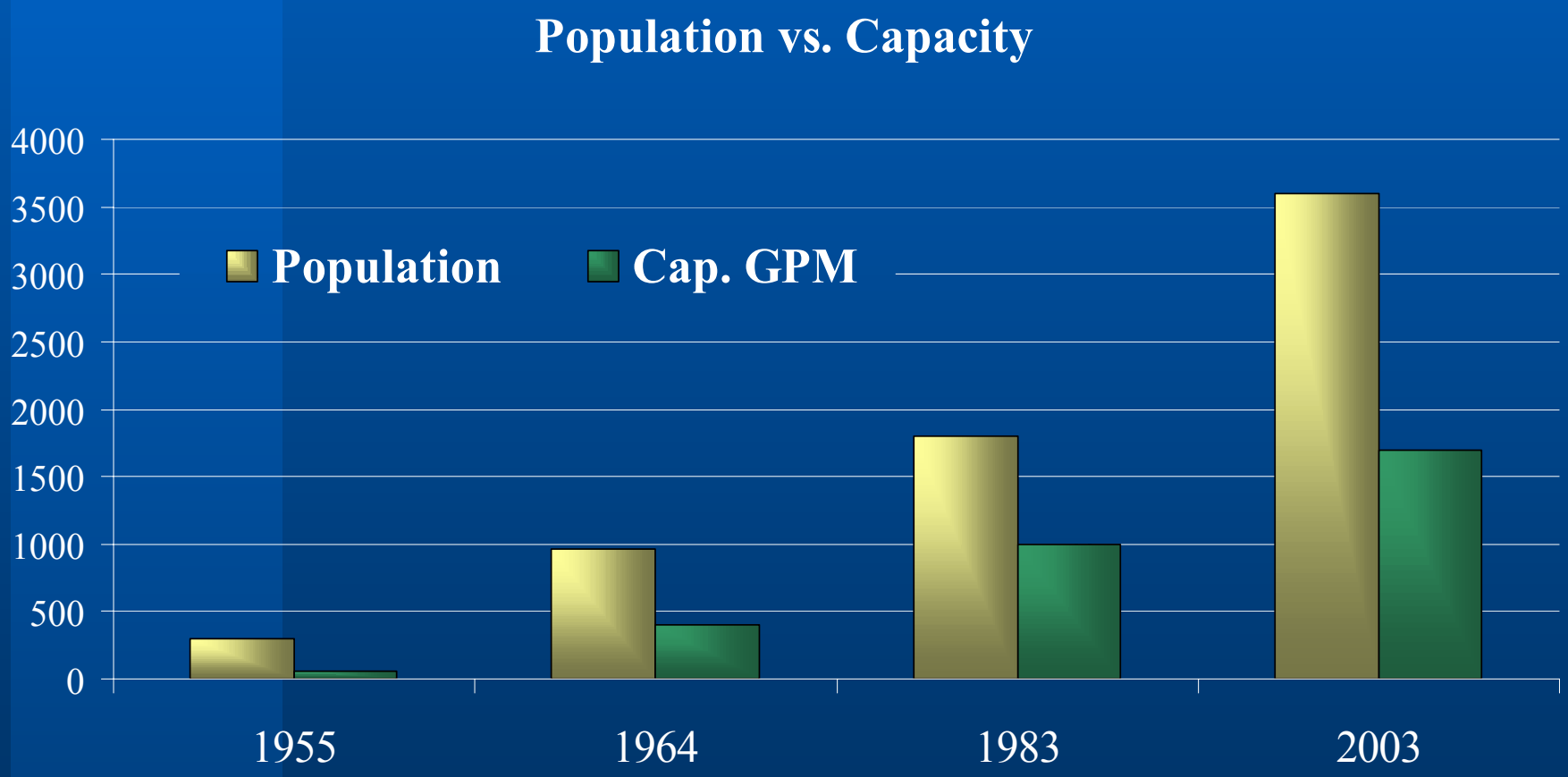
Note:

Emergency Interconnections serve 12 communities in RI

Current OOBT Practices

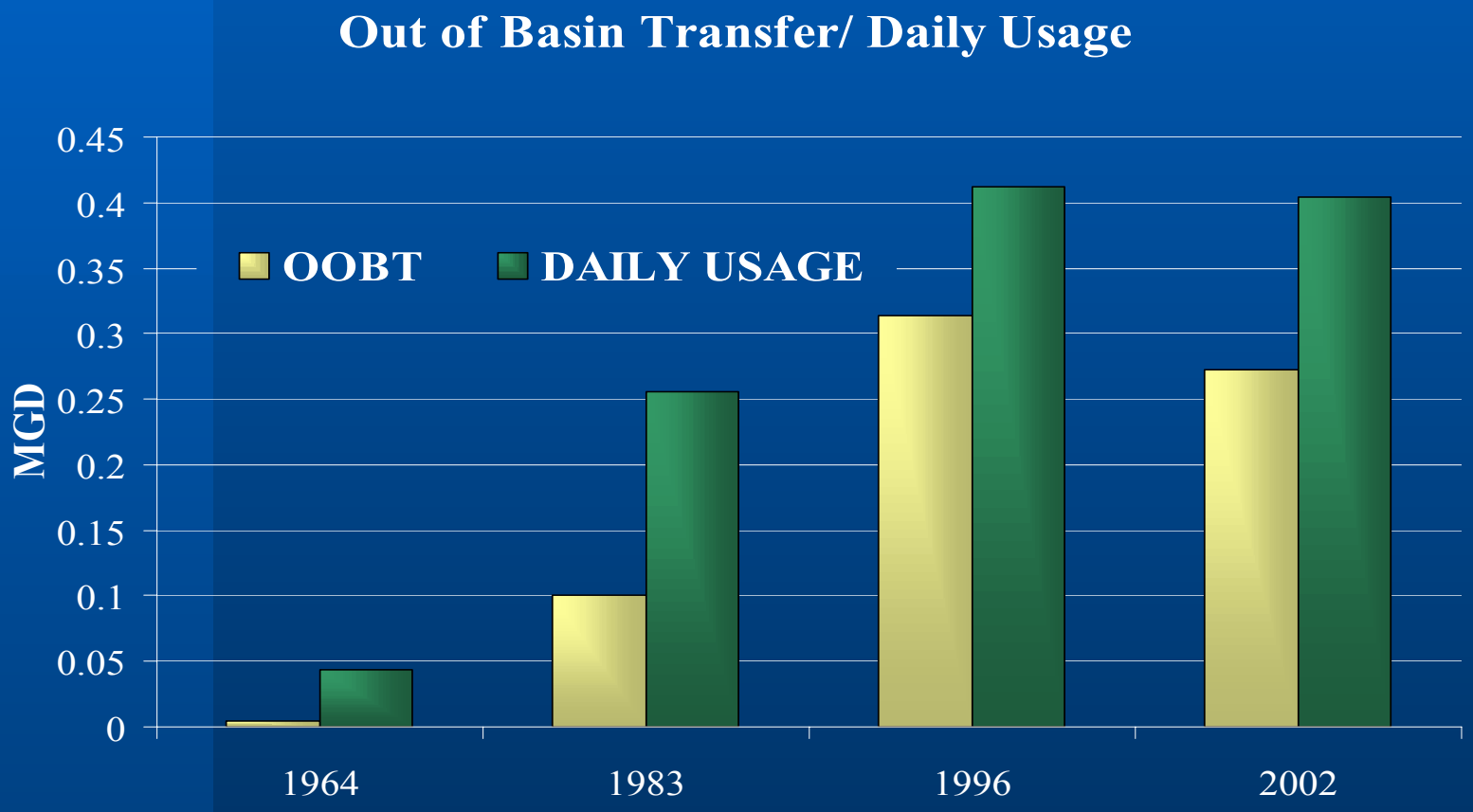
- Kingston Water District: Case Study
  - Most major public water supply systems operate on the assumption of using water at some distance from the source of supply
  - The rate and volume of withdrawals increase with population growth and increased activities, especially fire-fighting
  - The distance between the water source and point of use increases as the population expands

Current OOBT Practices



Kingston Water District

Current OOBT Practices



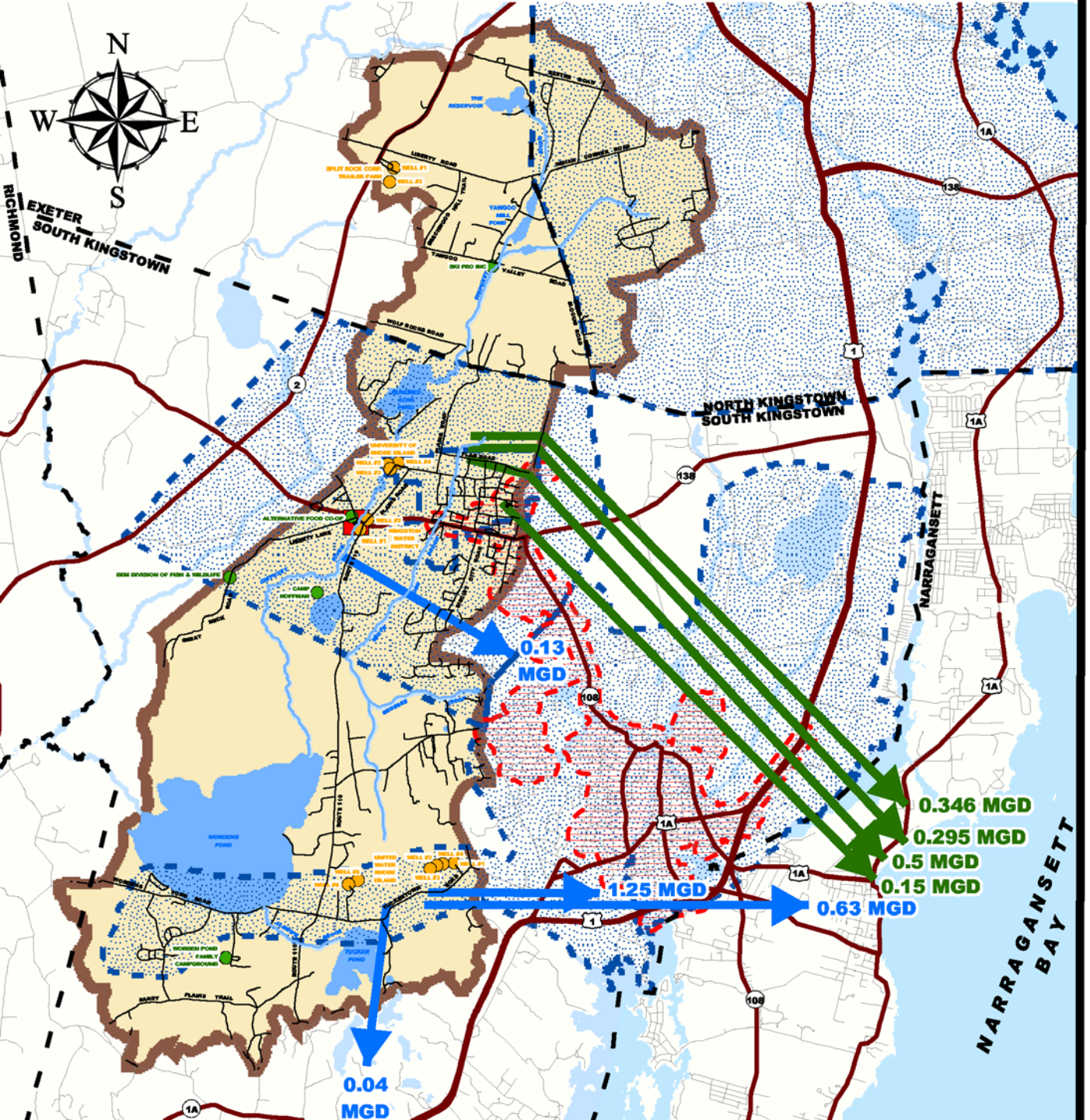
Kingston Water District

Current OOBT Practices

- Kingston Water District: Case Study
  - In RI, transfers can take place in relatively short distances
  - Transfers may occur between subbasins within the same watershed
  - Due to the proximity of the Kingston District, URI and United Water RI (wholesale accounts), water regularly moves in and out of several watersheds and subbasins

Current OOBT Practices

- Kingston Water District: Case Study
  - Transfers take place between watersheds
  - KWD exports 0.126 MGD of potable water from the Chipuxet
  - KWD exports 0.150 MGD of wastewater from the Chipuxet
  - URI exports similar volumes as KWD from the Chipuxet
  - UWRI pumps 2.8 MGD from the Chipuxet and an estimated 2.0 MGD is exported



SUMMARY OF OUT-OF-BASIN TRANSFERS

CHIPUXET BASIN RHODE ISLAND

- Community Wells
- Non-Community Wells
- Flow Health (-1,000% to -100%)

Out of Basin Transfers

- Potable Water
- Wastewater and Infiltration
- Major Roads
- Town Boundaries
- Minor Roads
- Rivers and Streams
- Water Supply Service Areas
- Sewered Areas
- Water Bodies
- Chipuxet Watershed (based on USGS HUC-12 Classification)

4,600 0 4,600 9,200 Feet

OOBT in the Chipuxet Subbasin

- Large amount of OOBT of potable water and wastewater identified (~3.55 MGD)
- Infiltration and stormwater inflow are significant
- Evaporative losses due to agricultural irrigation are considerable during the summer
- No water imports identified

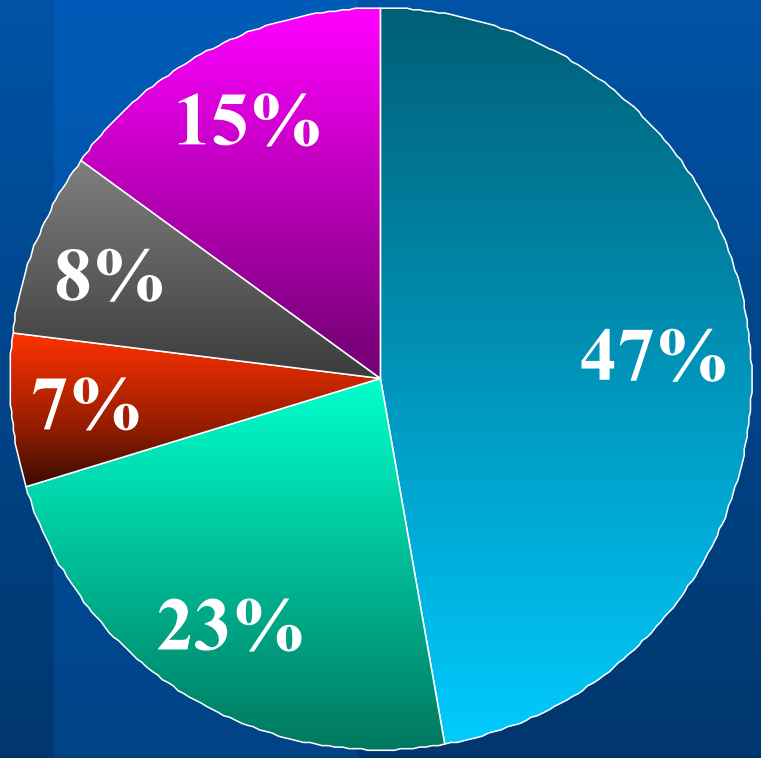
Note...

Infiltration - dry weather leaks due to poor construction

Inflow - intentional connections to reduce local storm water

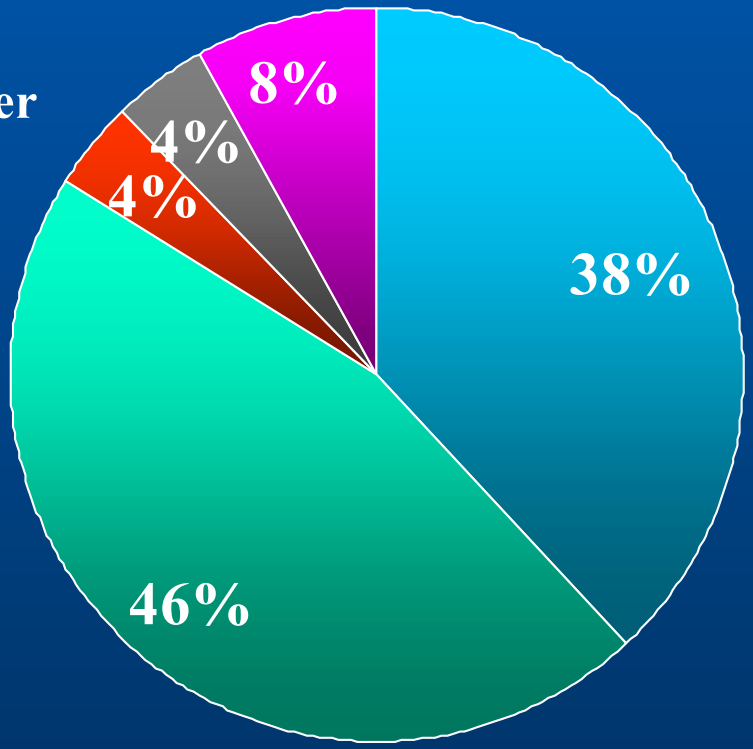
OOBT in the Chipuxet Subbasin

Annualized



Potable Water
Agriculture
Infiltration
Inflow
Sewage

Summer Months

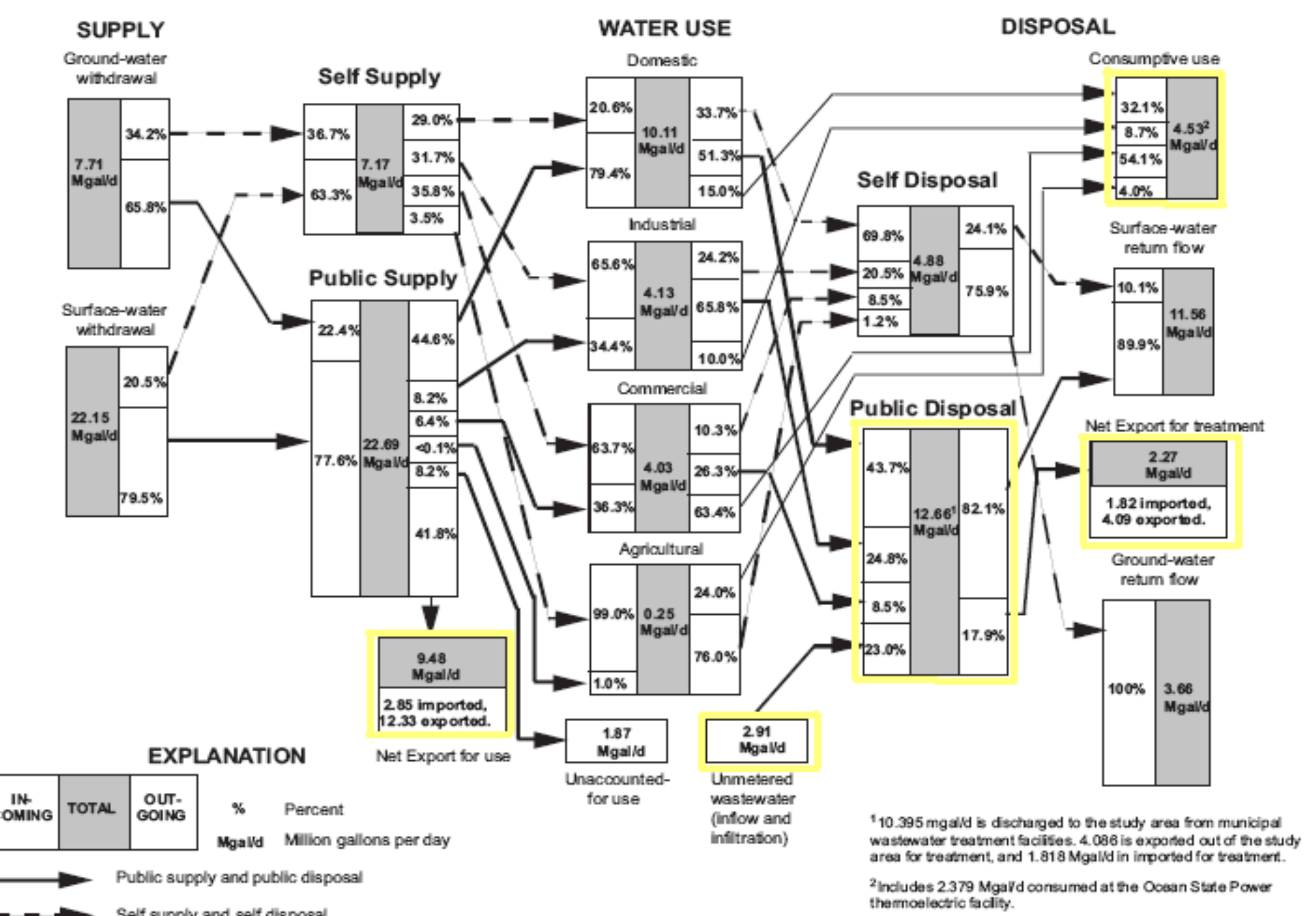


OOBT in the Blackstone Basin

- NEWUDS can track interbasin transfer of water and wastewater
  - Public supply is both imported and exported
  - Net export for use: 9.48MGD
    - 2.85MGD imported and 12.33MGD exported
  - Net export from basin: 2.27MGD
    - 1.82MGD imported and 4.09MGD exported
  - 2.379MGD consumed by Ocean State Power

Source:

- NEWUDS- New England Water Use Data System



[1] 10.395 mgal/d is discharged to the study area from municipal wastewater treatment facilities. 4.086 is exported out of the study area for treatment, and 1.818 Mgal/d in imported for treatment.

[2] Includes 2.379 Mgal/d consumed at the Ocean State Power thermoelectric facility.

Figure 10. Diagram of water withdrawals, use, and return flow for the Blackstone River Basin study area.

Why is Managing OOBT Necessary?

To avoid this!

Managing OOBT in Rhode Island

- **Management is needed to:**
  - Prevent streams from going dry
  - Control degradation of water quality in donor and receiving basins
  - Preserve aquatic habitat & recreational use of streams
  - Maintain sustainable basin yields for future development

The Problem

- No provision for water quantity considerations in local land use decisions
- Local officials do not have the expertise to sufficiently evaluate water availability
- Decisions are local, but impacts are regional
- Applicants spend lots of time and money but permitting is uncertain, biased or politicized
- Case-by-case approvals breed conflict
- Some applicants dodge existing procedures altogether

Existing OOBT Regulation in RI

- No legislation or regulations that explicitly address OOBT
- RI Coastal Resources Mgt. Council
  - Special Area Management Plans: Land Use Classification for Watershed Protection
    - New sewers are prohibited, unless certain conditions are met
    - Groundwater cannot be diverted from one salt pond watershed to another
  - Inland jurisdiction over certain activities

Conclusions

- Today, not enough data exists to adequately assess the impact of water uses or out-of-basin transfers

- Decision support tools are under development
  - Use water availability studies to establish geographic water accounting areas
  - Develop a statewide water information system
  - Employ geographic information systems
  - Invest in computer simulation models

Conclusions

- A comprehensive statewide permit system must be developed to manage and allocate water withdrawals:
  - OOBT would be one criteria to consider as part of the process
- A multi-disciplinary, technical team is necessary to properly evaluate proposed water uses based on science
- Water use planning needs to occur in tandem with land use planning at the basin level and consider the regional and local context

Conclusions

- Any new process must acknowledge existing authorities, laws, regulations and plans while promoting regional solutions
- Any new program must be efficient, have a reasonable period for phase-in, foster cooperation and information sharing and, thus, enable reliable and consistent decisions

Recommendations

- Discourage future OOBT, especially, but not exclusively of, groundwater – except during emergencies:
  - Encourage emergency interconnections
- Review existing written agreements between water suppliers
- Using NEWUDS, determine an accurate method to calculate OOBT for each basin

Recommendations

- Investigate a water withdrawal permit system that considers OOBT and other criteria
- Investigate a statewide "pre-application review process" for development projects that are deemed "significant" from a basin standpoint
- Revise the state's land use and zoning enabling acts to provide for sustainable development of water resources within geographic water accounting areas